

NOTES RELATING TO THE FLORA OF BHUTAN: X

A. J. C. GRIERSON

ABSTRACT. Taxonomic research into the families Cruciferae, Caryophyllaceae and Crassulaceae has revealed the following new species and subspecies: *Draba hicksii* Grierson, *Draba sherriffii* Grierson, *Cardamine violacea* (D. Don) Hook. f. & Thoms. subsp. *blutanica* Grierson, *Silene julaensis* Grierson and *Rhodiola marginata* Grierson.

CRUCIFERAE

Draba

Draba hicksii Grierson sp. nov. (Fig. 1) *D. altaicae* (C. A. Meyer) Bunge similis sed foliis obovatis et integerrimis, indumento plerumque minute stellato, scapis ebracteatis, floribus majoribus differt.

Planta humillima, dense pulvinaris, ramis caudiculorum numerosis, arcte congestis, 1-3 cm longis, inferne reliquiis foliorum emortuorum persistentibus. Folia obovata 3-7 × 1.5-2.5 mm, apice subacuta vel rotundata, base attenuata, subpetiolata, integra, subtus et margine pilis stellatis minutis, supra pilis simplicibus et furcatis ferentia. Scapi breves, 0.5-2 cm longi saepe caespitem vix superantes, 1-3-flori, racemosi, ebracteati,

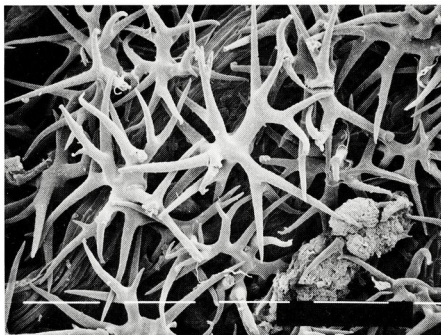


FIG. 1. *Draba hicksii* Grierson. SEM photograph of undersurface of a leaf of the holotype (Ludlow, Sherriff & Hicks 21111) showing the much branched stellate hairs (Each white line near the lower margin represents 100 μ m).

minute stellato-pubescentes. Sepala subaequantia, oblongo-ovata $2.5 \times 1-1.5$ mm, parce stellata. Petala alba, obovata $4.5-5 \times 1.5-2$ mm, apice rotundata, basin versus breviter unguiculata. Stamina $1.75-2$ mm longa; antherae ovoideae c. 0.5 mm. Ovarium late ovoideum, compressum $1-1.25 \times 0.75-1$ mm; stylus $0.5-0.8$ mm longus; stigma capitatum. Siliculae ovoidea, circa 3.5×2.5 mm.

BHUTAN: Shingbe (Me La), 4570 m, 27 viii 1949, 'flowers white, situation: scree', Ludlow, Sherriff & Hicks 21111 (holo. BM); Me La, 4265 m, 5 viii 1933, 'white, open grassy hillside', Ludlow & Sherriff 407 (BM); Me La (South side), 4400 m, 9 vi 1949, 'flowers white, situation: scree', Ludlow, Sherriff & Hicks 20348 (BM).

The indumentum of this species is very distinctive, at least among the Drabas of E Himalaya, consisting of minute subsessile stellate hairs with 4-6 radiating primary branches each of which may bear 2-3 branches, these are most abundant on the undersides of the leaves; there are also a few larger simple and forked hairs on the upper surface.

All the above specimens are in flower without even immature fruit but the size and shape of the silicules have been observed from the persistent repla of the previous year.

Draba sherriffii Grierson sp. nov. *D. lasiophyllae* Royle similis sed folia caulina pauciora, flores majoribus, siliculis elongatis linearibus differt.

Herba laxae caespitosa, ramis caudiculis $1-5$ cm longis, inferne reliquis foliorum emortuorum persistentibus. Caules plures, ascendentes $6-20$ cm longi, remote foliosi, pilis simplicibus ferentes. Folia basalia obovato-spathulata $7-35 \times 2-5$ mm, acuta, base attenuata, utrinque pilis stellatis (plerumque $3-4$ -ramosis) et in pagina superna pilis simplicibus et furcatis ferentia; folia caulina pauca $2-3(-5)$, elliptica, $6-30 \times 3-8$ mm, acuta, basi cuneata, sessilia, utrinque $1-3$ -dentata. Racemi $3-9$ -flori, ebracteati, pedicellis floriferis $5-8$ mm. Sepala olivacea, oblongo-elliptica, 3.5×1 mm, obtusa. Petala alba, obovato-cuneata 8×3 mm apice rotundata vel emarginata. Stamina $3-4$ mm longa, antheris ovoideis. Ovarium anguste oblongum $3-3.5$ mm longum; stylus 0.5 mm longus; stigma capitatum. Siliculae lineares $18-23 \times 1.5$ mm, compressae, apice acutae, valvis glabris, fere enervibus. Semina utrinque $10-15$, submatura, ovoidea ca 1.2×0.6 mm.

BHUTAN: Namdating, Upper Tongsa Chu Valley, 4400 m, 17 vii 1949, 'corolla pure white, calyx brownish green, on cliff ledges and steep grassy hillsides among stones', Ludlow, Sherriff & Hicks 19440 (holo. BM, iso. E); Saga La, Upper Mangde Chu, 4700 m, 14 vii 1949, 'calyx olive green, corolla white, in wet sandy soil', Ludlow, Sherriff & Hicks 16831 (BM, E); Shashona, Mangde Chu, 4570 m, 12 vi 1966, 'white flowers, yak pasture', Bowes Lyon 3449 (BM); Tang Chu/Sefu Chu ridge, 4000 m, 12 vi 1969, 'white flowers', Bowes Lyon 15032 (BM).

The above new species resembles and is probably related to *D. lasiophylla* but, as the name of the latter implies, its leaves are greyish and densely covered with stellate hairs (not green and moderately pubescent as they are here); the cauline leaves are generally more numerous, as many as 10; the flowers are smaller, petals not more than 3 mm long; the pods ovate and smaller $7-8$ mm long and sparsely pubescent with forked hairs.

Cardamine

Cardamine violacea (D. Don) Hook. f. & Thoms. subsp. **bhutanica** Grierson subsp. nov.

A subspecies typica caulibus 20–45 cm altis, foliis basalibus florendi tempore adsunt, foliis caulinis anguste ovatis vel oblanceolatis, basi plus minusve late auriculatis, racemis 5–12 floribus differt.

BHUTAN: Pele La, 3300 m, 19 vi 1975, 'Roadside bank in thin cloud forest. Flowers mauve', Grierson & Long 546 (holo. E); E side of Dochu La, 2750 m, 15 v 1979, Grierson & Long 1057 (E); Damthang, 3050 m, 6 vi 1933, Ludlow & Sherriff 62 (E, BM); below Duke La [Dochu La] on N side, 2750 m, 21 v 1915, Cooper 3918 (E, BM).

Typical specimens of *C. violacea* from Nepal are commonly 60–100 cm tall and lack basal leaves. Cauline leaves are elliptic-oblanceolate, 5–18 × 0.75–3.5 cm, gradually acuminate at the apex and narrowly auricled at the base, whereas those of subsp. *bhutanica* are ovate or oblanceolate, 3–6 × 0.75–2 cm, obtuse, acute or shortly acuminate at the apex and those at mid-stem are usually broadly auricled at the base. Flowers tend to be more numerous, (11–)15–50 per raceme and darker purple in the typical variety.

CARYOPHYLLACEAE

Silene

Silene julaensis Grierson sp. nov. (Fig. 2) *S. gonospermae* (Ruprecht) Bocquet similis sed graciliore, foliis ovato-oblongis, petalis citrinis, stylis 3 differt.

Herba perennis, tenuiter rhizomata. Caules ascendentes, graciles, simplices 4–10 cm alti, dense purpureo-pubescentes. Folia ovato-oblonga 5–7 × 2–3 mm, acuta, basi breviter attenuata, subpetiolata, pilis purpureis ciliata. Flos solitarius, nutans. Calyx campanulatus, subinflatus; tubum 5–6 mm longum, purpureotinctum, costis 10, pubescentibus; dentes c. 2 mm longi. Petala calycem subaequantia, cuneiformia, citrina 6 × 1.5 mm; limbus breviter bidentatus, appendicibus binis, oblongis, 0.2–0.3 × 0.5 mm prope apicem limbi insertis. Ovarium ovoideum c. 2.5 mm longum, stylis 3 ferens; gonophorum c. 1 mm. Capsula et semina ignota.

BHUTAN: Ju La (S side), Dhur Chu, 4265 m, 21 vii 1949 'On open grassy slopes. Corolla lemon-yellow. Calyx dark red-purple', Ludlow, Sherriff & Hicks 19473 (holo. E, iso. BM).

Although similar to *S. gonosperma* this new species more strongly resembles *Arenaria melandryiformis* F. N. Williams so far as habit and leaf shape are concerned; indeed, the type was at first provisionally identified as this species. However, the campanulate calyx and appendaged petals at once distinguish it from members of the latter genus.

CRASSULACEAE

Rhodiola

Rhodiola marginata Grierson sp. nov. (Fig. 3) *R. stapfii* similis sed foliis alternatis pallide marginatis, floribus in axillis bractearum foliiformium subsessilibus differt.



FIG. 2. *Silene julaensis* Grierson. Specimens on holotype (Ludlow, Sherriff & Hicks 19473).



FIG. 3. *Rhodiola marginata* Grierson. Portion of one specimen on the holotype (Ludlow, Sherriff & Hicks 19133) (Magnification $\times 5$).

Rhizomata erecta; apice 5–15 mm diam., squamis et fibris dense oblecta; squamae hornitonae ovatae c. 1.5×1 mm atrocastaneae. Caules erecti 0.5–2.5 cm dense papillati, pro parte maxima nudi sed apices versus foliis 5–8 aggregatis. Folia obovata, suborbicularia vel flabellata 3–7 mm longa et lata, apice rotundata vel subacuta, basi abrupte attenuata, marginibus incrassatis pallidis 0.4–0.5 mm latis, integerrimis, supra glabra, subtus papillata; petioli ad 7 mm longi, ecalcarati. Flores unisexuales, 3–20, subsessiles (pedicellis ad 1 mm longis) in axillis breactearum foliiformium, tetrameri. Lobi calycis elliptici 2.5×1 mm, obtusi, pallide marginati, ecalcarati. Petala rubella, ovata, lobos calycis plus minusve breviora, basi c. 1 mm lata, apice acuminata, inflexa. Stamina c. 1 mm longa, ea epipetala c. 0.4 mm supra basin petalarum inserta. Pistillodia subulata c. 0.5 mm longa. Squamae nectariferae subquadratae c. 0.25 mm Flores foeminei ignoti.

BHUTAN: Upper Bumthang Chu, Pangotang, 3800 m, 'in little clumps in rock crevices on cliff faces, flowers reddish green, anthers golden', 14 vi 1949, Ludlow, Sherriff & Hicks 19133 (holo. BM).

Although resembling *R. stapfii* this new species may not be related to it but, in the absence of female flowers and fruit, it is probably impossible to assess satisfactorily its true affinities. *R. marginata*, however, remains distinct on account of its small size, its rounded leaves with their broad, pale coloured thickened margins and its unisexual flowers which are subsessile in the axils of leaf-like bracts.